

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (withdrawn) An article of manufacture, comprising:  
a substrate having a surface; and  
a cobalt-phosphorous-boron coating applied to said surface.
2. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating contains cobalt in the range of about 80 to 90 weight percent.
3. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating contains phosphorous in the range of about 10 to 15 weight percent.
4. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating contains a maximum of about 5 weight percent boron.
5. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating is applied to non line-of-sight areas of said surface.
6. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating is ductile.

7. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating is free of micro cracks.

8. (withdrawn) The article of manufacture of claim 1, wherein said cobalt-phosphorous-boron coating provides good surface adhesion.

9. (withdrawn) An article of manufacture, comprising:  
a substrate having a surface; and  
a cobalt-phosphorous-boron coating applied to said surface;  
wherein said cobalt-phosphorous-boron coating contains cobalt in the range of about 80 to 90 weight percent, phosphorous in the range of about 10 to 15 weight percent, and a maximum of about 5 weight percent boron.

10. (withdrawn) The article of manufacture of claim 9, wherein said substrate is selected from the group of nickel, cobalt, iron, steel, aluminum, zinc, palladium, platinum, copper, brass, chromium, tungsten, titanium, tin, silver carbon, graphite, and alloys thereof.

11. (withdrawn) The article of manufacture of claim 9, wherein said substrate is selected from the group of ferrous alloys, nickel alloys, copper alloys, and aluminum alloys.

12. (withdrawn) The article of manufacture of claim 9, wherein said article of manufacture is a part of a commercial aircraft.

13. (currently amended) A plating bath, comprising:  
a cobalt-phosphorous plating solution having a pH value in the range of about 1 to about 1.8;  
cobalt metal ions contained within said plating solution;  
chloride ions contained within said plating solution as alkali

chloride;

phosphorous ions contained within said plating solution;

boron as an oxidizing agent contained within said plating solution

as perborate; and

10 a hardening agent contained within said plating solution;

wherein a cobalt-phosphorous-boron coating is obtained through electroplating in said plating solution, said coating containing cobalt in the range of about 85 to 90 weight percent, phosphorous in the range of about 10 to 15 weight percent, and boron.

14. (canceled)

15. (original) The plating bath of claim 13, wherein the cobalt metal content of said plating solution is in the range of about 4.4 to 5.8 oz/gal.

16. (currently amended) The plating bath of claim 13, wherein a source of said cobalt metal ions includes cobalt sulfate or ~~and other~~ cobalt salts.

17. (original) The plating bath of claim 13, wherein cobalt chips submerged in said plating solution is the source of said cobalt metal ions.

18. (original) The plating bath of claim 13, wherein cobalt balls submerged in said plating solution is the source of said cobalt metal ions.

19. (currently amended) The plating bath of claim 13, wherein a source of said chloride ions includes sodium chloride ~~and other chloride compounds.~~

Claims 20-22 (canceled)

23. (original) The plating bath of claim 13, wherein phosphite comprises said hardening agent.

24. (original) The plating bath of claim 23, wherein phosphorous acid provides said phosphite.

25. (currently amended) The plating bath of claim 23, wherein sodium phosphite or ~~and~~ sodium hypophosphite provide said phosphite.

26. (original) The plating bath of claim 13, wherein said plating solution contains phosphate.

27. (original) The plating bath of claim 26, wherein said phosphate is selected from the group of phosphoric acid, cobalt phosphate, and sodium phosphate.

28. (currently amended) A cobalt-phosphorous plating solution, comprising:

cobalt sulfate ( $\text{CoSO}_4 \cdot 6\text{H}_2\text{O}$ ) within a range of about 20 to 26 oz/gal;

5 sodium chloride ( $\text{NaCl}$ ) within a range of about 2 to 3.5 oz/gal;

boron as perborate within a range of about 1.6 to 2.6 oz/gal;

phosphite as phosphorous acid ( $\text{H}_3\text{PO}_3$ ) within a range of about 1.6 to 2.6 oz/gal; and

10 phosphate as phosphoric acid ( $\text{H}_3\text{PO}_4$ ) within a range of about 7 to 9 oz/gal;

wherein said cobalt sulfate, said sodium chloride, said perborate, said phosphorous acid, and said phosphoric acid are combined in tanks; and

wherein said cobalt-phosphorous plating solution has a pH range of about 1 to 1.8.

29. (canceled)

30. (canceled)

31. (original) The cobalt-phosphorous plating solution of claim 28, wherein said cobalt-phosphorous plating solution has a surface tension of about of 35 to 50 dyne/cm.

32. (currently amended) The cobalt-phosphorous plating solution of claim 28, wherein said cobalt-phosphorous plating solution has a temperature of about ~~440~~ 100 to ~~470~~ 160°F.

33. (original) The cobalt-phosphorous plating solution of claim 28, wherein an anode and a cathode are submerged into said cobalt-phosphorous plating solution, and wherein said anode is a platinized metal anode, and wherein said cathode is an article of manufacture having a surface to be plated.

34. (currently amended) The cobalt-phosphorous plating solution of claim 33, wherein said anode comprises cobalt chips or ~~and~~ cobalt balls.

35. (currently amended) The cobalt-phosphorous plating solution of claim 28, wherein a direct current is applied that generates a cathode current density in the range of about 60 to 288 Amps/ft<sup>2</sup> ~~Amps/f<sup>2</sup>~~.

36. (currently amended) A process for plating, comprising the steps of:

submerging ~~providing~~ a substrate having a catalytically active surface into a cobalt-phosphorous plating solution having a pH value in the range of about 1 to about 1.8;

~~cleaning and preparing said surface during a pretreatment process;~~

hooking said substrate as a cathode;

10 providing an anode and submerging said anode into said cobalt-phosphorous plating solution;

applying direct current between said cathode and said anode; and

applying a cobalt-phosphorous-boron coating to said surface during a cobalt-phosphorous plating process; and

~~finishing said surface during a post treatment process~~

15 wherein said coating contains cobalt in the range of about 85 to 90 weight percent, phosphorous in the range of about 10 to 15 weight percent, and boron.

37. (currently amended) The process for plating of claim 36, further including the steps of:

cleaning and preparing said surface during a pretreatment process; and

5 finishing said surface during a post treatment process.

~~wherein said substrate has a catalytically active surface.~~

38. (currently amended) The process for plating of claim 37 36, wherein said pretreatment process comprises the steps of:

degreasing said surface;

masking areas of said surface not to be plated;

5 cleaning said surface using dry abrasive blast;

alkaline cleaning said surface; and

acid activating said surface

39. (canceled)

40. (currently amended) The process for plating of claim 37 ~~36~~, wherein said post treatment process comprises the steps of:

demasking said surface; and

baking said surface having said cobalt-phosphorous-boron coating

5 applied.

41. (currently amended) A process for plating an article of manufacture used in the aerospace industry, comprising the steps of:

providing a part of a commercial aircraft including a substrate having a surface to be plated;

5 degreasing said surface of said part;

masking areas of said surface not to be plated;

cleaning said surface using dry abrasive blast;

alkaline cleaning said surface;

acid activating said surface;

10 providing a cobalt-phosphorous plating solution, wherein said cobalt-phosphorous plating solution has a ph value in the range of about 1 to about 1.8 and comprises:

cobalt sulfate ( $\text{CoSO}_4 \cdot 6\text{H}_2\text{O}$ ) within a range of about 20 to 26 oz/gal;

15 sodium chloride ( $\text{NaCl}$ ) within a range of about 2 to 3.5 oz/gal;

boron as perborate within a range of about 1.6 to 2.6 oz/gal;

20 phosphite as phosphorous acid ( $\text{H}_3\text{PO}_3$ ) within a range of about 1.6 to 2.6 oz/gal; and

phosphate as phosphoric acid ( $\text{H}_3\text{PO}_4$ ) within a range of about 7 to 9 oz/gal;

~~providing a platinized metal anode and~~ submerging said an anode into said cobalt-phosphorous plating solution;

25                   submerging said part into said cobalt-phosphorous plating  
solution;  
                      hooking said part as a cathode;  
                      applying direct current between said anode and said cathode that  
generates a cathode current density in the range of about 60 to 288 Amps/ft<sup>2</sup>  
30   Amps/ft<sup>2</sup>;  
                      plating said surface of said part with a cobalt-phosphorous-boron  
coating, wherein said cobalt-phosphorous-boron coating comprises:  
                          cobalt in the range of about ~~80~~ 85 to 90 weight percent;  
                          phosphorous in the range of about 10 to 15 weight percent;  
35   and  
                          ~~a maximum of about 5 weight percent boron;~~  
                      demasking said surface;  
                      baking said part having said cobalt-phosphorous-boron coating  
applied within 8 hours of application of said coating; and  
40                   using said part having said cobalt-phosphorous-boron coating in a  
commercial aircraft.

42.   (original)     The process for plating an article of manufacture  
used in the aerospace industry of claim 41, further comprises the step of  
providing tanks that hold said cobalt-phosphorous plating solution.

43.   (currently amended)     The process for plating an article of  
manufacture used in the aerospace industry of claim 41, further comprises the  
step of heating said cobalt-phosphorous plating solution to a temperature of  
about ~~130~~ 100 to ~~140~~ 160° F.

44.   (original)     The process for plating an article of manufacture  
used in the aerospace industry of claim 41, further comprising the step of  
applying said cobalt-phosphorous-boron coating to said surface at a plating rate



of about 0.001 to 0.005 inch/hr.